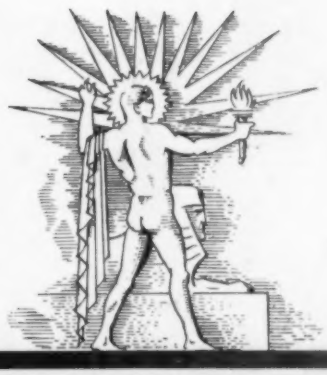
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



September 24, 1938

Snow-Sculptured

See Page 200

A SCIENCE SERVICE PUBLICATION

Do You Know?

A soapless soap made of milk whey is to be tried in Germany.

Tourists used to visit Egyptian tombs in Greek and Roman times.

The snapping turtle snaps so hard that it sometimes loses its balance.

The U. S. Bureau of Dairy Industry has identification records of 320,000 cows.

To avoid holes in tin cans, photoelectric cells inspect the sheet steel before it is made up.

"Chewing resistance" is a scientific term for describing toughness or tenderness of food.

A day without a thunderstorm is uncommon in Buitenzorg, Java: it thunders 322 days in the year.

Portable air conditioning units are used to make an "oasis" for field workers of an oil company on duty in the Arabian desert.

High-speed elevators carry visitors 900 feet into the depths of Carlsbad Caverns in New Mexico, and a 1,320-foot penetration is planned.

Excavating an old Scythian settlement in the Ukraine, Soviet archaeologists have found evidence that ancient Scythians were good farmers and cattle breeders.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

ANTHROPOLOGY

What will the American woman of the future look like? p. 201.

ASTRONOMY

How can astronomers "see" objects too faint to photograph? p. 196.

What has added to waist-line of Venus? p. 204.

Who made the first astronomical discovery? p. 202.

AVIATION

What new device shows dispatchers the direction of an approaching airplane? p. 199.

BOTANY

Why is face powder used on plants? p. 198.

ECOLOGY

Why do timberline trees lean away from the wind? p. 200.

HYGIENE

How can a worker protect his own health? p. 199.

MEDICINE

How will physicians of the future provide for a baby's coming? p. 197.

What drug will prevent scarlet fever? p. 197.

PALEONTOLOGY

Who was the owner of the most valuable teeth in the world? p. 195.

PHYSICS

What accidental discovery may change methods of glass making? p. 205.

What does "yukon" mean to physicists? p. 196.

What makes an artillery shell sleep during its flight? p. 200.

PSYCHOLOGY

How can old minds be made young again? p. 201.

What mental queernesses are common? p. 201.

Where is Uncle Sam studying America's mental health? p. 204.

Why do men set the forests afire? p. 204.

Why is a successful salesman self-confident? p. 201.

EDUCATION

Why is learning to read sometimes a waste of time? p. 203.

SURGERY

What job is the surgeon faced with most often? p. 200.

ZOOLOGY

How does the prudent woodpecker lack in wisdom? p. 198.

Putting raw meat on a black eye was an old Egyptian remedy.

A skating rink has been carved inside an Alpine glacier, near the top of the Jungfrau.

The amphitheater of the University of California Medical School is now decorated with murals showing dramatic scenes of healing and medical progress in the state's history.

Canned carp is proving a cheap and satisfactory food for mink on fur farms.

Giant orioles of South America build gourd-shaped nests that sometimes dangle six feet long.

Potatoes are partly blamed for the World War, on the grounds that introduction of the potato into northern Europe made a great increase in population possible.

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PALEONTOLOGY

New African Ape-Man Skull Has Marked Human Characters

Boy Who Made Discovery Carried Teeth Around in Pocket Until Tremendous Importance of His Find Was Realized

By E.N. FALLAIZE
Fellow, Royal Anthropological Society

THE STORY of how four of "the most valuable teeth in the world" were carried about in a schoolboy's trousers pocket is told by Dr. Robert Broom of the Transvaal Museum, Pretoria, South Africa, (*Nature,* Aug. 27), in describing the discovery of remains of a previously unknown form of fossil anthropoid ape. In certain features this fossil ape is closer to man than any anthropoid ape, whether extinct or still in existence, known from any part of the world.

The discovery was made by a schoolboy, Gert Terblanche, who knocked part of a fossil skull and jaw out of an outcrop of fossil-bearing limestone deposit near the top of a hill at Kromdraai, about two miles from the Sterkfontein cave where Dr. Robert Broom made his previous discovery of a fossil anthropoid skull. The boy gave away part of the palate with one molar tooth still attached. This came into the possession of Dr. Broom, who, recognizing that it belonged to a new type of anthropoid, found the boy, with four teeth still in his possession, and with his help extracted further fragments of the skull from the deposits.

Nearly Complete

Dr. Broom now has the nearly perfect palate with most of the teeth, practically the whole of the left side of the lower part of the skull, and the greater part of the right side of the lower jaw. Nearly the complete dentition is now known, as it has been possible to reconstruct missing teeth from the impressions in the matrix.

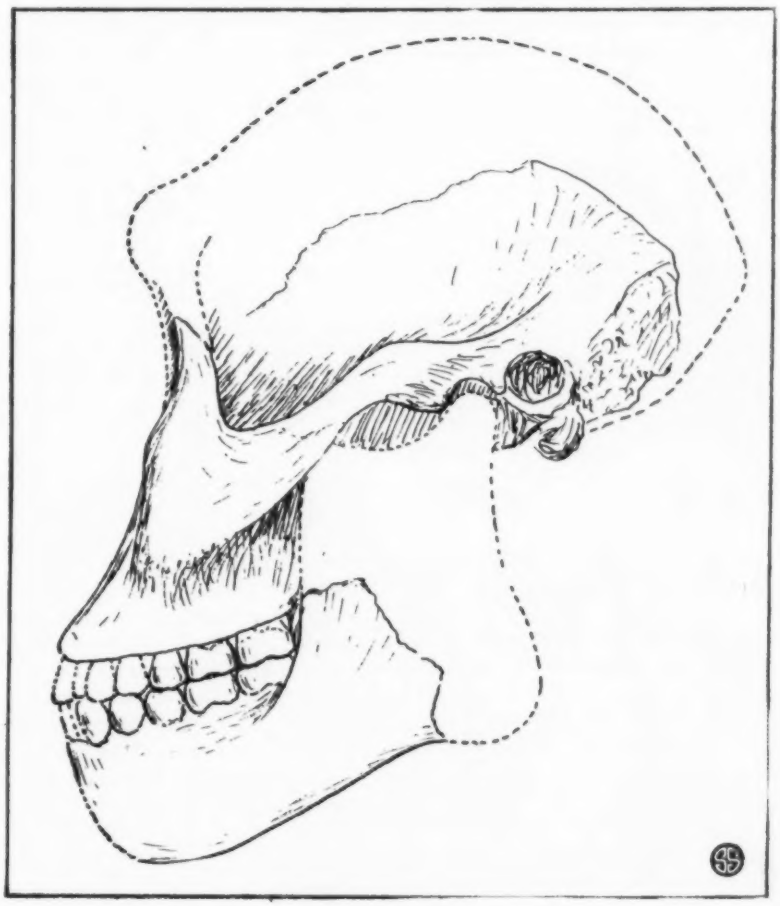
The remains are those of a large ape, larger than the male chimpanzee and nearly as large as the female gorilla; but the parts of the skull which have been found show that it resembled neither chimpanzee nor gorilla. These include part of the cheek bone, and show how the jaw was articulated to the skull. Except that they are much larger, their form and relation one to another differ from that found in the ape, and are almost exactly as in man.

No fossil ape has ever been found which is so nearly in line with man. The disposition of the teeth and arch of the jaw is more like that of man than of the anthropoids; while the canine teeth, which are large in the apes, are relatively small and very human in shape. In several other details the teeth bear a remarkable resemblance to the human.

Further, from the relation of the bones of the skull one to another as compared with that found in the chimpanzee and the gorilla, Dr. Broom is able to deduce that this anthropoid walked somewhat more erectly than the living anthropoids.

From the fossilized remains of the animals found in the deposit, Dr. Broom concludes that this anthropoid, to which he proposes to give the name *Paranthropus robustus* to suggest its close relation to man, belongs to the period of the Middle Pleistocene, whereas the Taungs skull, *Australopithecus africanus,* discovered by Prof. Raymond Dart in 1925, belongs to the earlier period of the Lower Pleistocene, and the Sterkfontein skull, discovered by Dr. Broom himself, belongs to the Upper Pleistocene.

Some further teeth and a part of the front of a young male jaw belonging to the Sterkfontein type of anthropoid have also been found recently by Dr. Broom. On this new evidence he concludes that the Sterkfontein skull is



300,000-YEAR-OLD APE FOSSIL

It had so many human-like characters that it is fairly entitled to be called the long-sought Missing Link, recently found at Kromdraai Farm near Sterkfontein, South Africa. It has been given the zoological name Paranthropus robustus. Dotted outlines fill in where parts are missing.

even closer in its resemblance to man than he had previously thought. He therefore proposes to alter its name accordingly to *Plesianthropus transvaalensis*.

From these three important discoveries—the Taungs skull found in 1925 by Prof. Dart, the Sterkfontein skull of which the first fragments were found by Dr. Broom in 1936, and the Kromdraai skull of which the discovery in 1938 is now announced—it is evident that there survived in South Africa so late as Pleistocene times a number of large-brained anthropoid apes which in certain details of their structure and especially in their teeth came close to man —all of them in fact, resembling man more closely than do either chimpanzee or gorilla.

As Sir Arthur Keith has pointed out, they are too late in time to come into the direct line of succession which leads up to man; but they indicate the lines upon which the earlier forms of anthropoid apes, from which they themselves were descended, must have been modified in the growth of the human tree.

Science News Letter, September 24, 1938

ASTRONOMY

Glowing Masses of Gases Found In Milky Way

Luminosities Containing Hydrogen and Oxygen, Too Faint for Photography, Found With Spectrograph

A GLOWING mass of hydrogen and oxygen gases, hitherto undiscovered, envelops large portions of the Milky Way, Drs. Otto Struve and C. T. Elvey of the University of Chicago's Yerkes Observatory reported to the American Astronomical Society.

These luminous nebulosities, in the constellations of Cygnus and Cepheus, are too faint to be recorded on direct photographs. They were found with the new 150-foot nebular spectrograph of the McDonald Observatory of the University of Texas in the Davis Mountains. Their existence could only be proved by means of spectrograms photographically sensitive to the light of the parts of the spectrum known as the hydrogen line alpha and the forbidden oxygen line 3727.

To an astronomer who could observe our vast Milky Way galaxy from some object far outside it, the spectrum of our galaxy as a whole would appear different from what astronomers supposed it would before the discovery by Drs. Struve and Elvey. It would reveal "a fairly strong emission spectrum superimposed over the integrated spectrum of all the stars."

The newly-discovered great "clouds" do not shine by their own light, but they appear to derive the required energy of their fluorescence from the general field of stellar radiation in the Milky Way star clouds. They differ from brighter nebulosities in that they are not concentrated toward individual stars.

Drs. Struve and Elvey consider it probable that many other portions of the Milky Way are covered by similar gaseous "clouds" but an investigation of a region in Canis Major shows practically no trace of nebular emission. The emission decreases very rapidly away from the Milky Way and at galactic latitudes of 10 or 20 degrees no emission is found.

Stars Seen Circling

A new theory of a circular motion of stars "streaming" at high speeds in our galaxy was presented by Dr. S. Chandrasekhar, of the Yerkes Observatory, one of the eminent East Indian scientists working in this country.

Dr. Chandrasekhar's theory visualizes our nearby stars, among them the sun, swinging nearly circular orbits about the center of the galaxy.

If the nearby stars are taken as a group, the individual stars seem to be moving at random, with equal numbers of stars moving in opposite directions. But there is a maximum mean speed of the order of 15 kilometers per second (9 miles per second) in one direction. As a whole, however, this group has a nearly circular motion about the distant galactic center, a velocity of about 300 kilometers per second (185 miles per second).

The theory explains the dispersion of velocities with respect to the center of the local star group as due to the deviations of the actual orbits from a true circular orbit.

Science News Letter, September 24, 1938

MAKES DISCOVERY

This 150-foot nebular spectrograph of the McDonald Observatory was instrumental in the finding of unknown glowing masses of gas in the Milky Way.

PHYSICS

New Cosmic Ray Particle— "Baryton" or "Yukon?"

THE physicists have nearly as much trouble naming a new fundamental particle as a family of fond parents, grandparents and in-laws deciding what to call a new baby.

Now it is the heavy electron, the particle that lives only about a millionth of a second after being born of the cosmic rays, that is being christened enthusiastically.

Americans are calling the heavy electron "baryton," the first part of the word being Greek for "heavy." But Europeans, with Prof. Niels Bohr, of Copenhagen, as chief protagonist, are using "yukon" in honor of the Japanese physicist, Yukawa, who postulated the existence of the particle before Drs. C. D. Anderson and Seth Neddermeyer, of Pasadena, discovered it in 1937.

In discussion at the recent Cambridge meeting of the British Association, one of the Americans present observed that yukon was a rather cold name for a particle so hotly discussed and that Alaskans might protest.

The heavy electrons seem to make up the major portion of the penetrating particles resulting from the cosmic radiation. Scientists are flying high into the atmosphere and setting up apparatus

deep in tunnels in order to study them.

With some 240 times the mass of the ordinary electron, basic unit of electricity, the heavy electron is lighter than the proton, the nucleus of the hydrogen atom. It may very well be triplets, for it would be logical for it to be found with negative and positive charges as well as no charge at all.

It is a very unstable creature, existing theoretically for a mere millionth of a second when at rest. Strangely enough, it lives longer when it goes fast, owing to the relativistic change in time. One of them by great good luck was photographed at Pasadena coming to rest. Heavy electrons are supposed to disintegrate into electrons and neutrinos. And neutrinos are particles postulated but not yet discovered.

Science News Letter, September 24, 1938

MEDICINE

Future Babies to Arrive "At Home" Is Prophecy

Doctor and Nurse Will Hurry to Scene in Specially Equipped Autos; Specialists by Plane If Needed

TOMORROW'S babies will not necessarily be born in a hospital.

It will again be socially and medically acceptable to be born in the home of one's parents or in a village nursing home for obstetrics. In fact, such a birthplace will be safer and saner than the hospital for all who live outside of cities.

Dr. A. J. Skeel, director of obstetrics, St. Luke's Hospital, Cleveland, sees the maternity care of the future divided as follows:

1. In large cities all babies will be born in hospitals—special maternity hospitals or general hospitals that have small maternity units where mothers may be isolated from other mothers and babies from other babies. The big nurseries and maternity services of today will be taboo.

2. In the smaller community the babies of the future will be born in small nursing homes for obstetrics, no patients except maternity patients being accepted. When complications arise, a specialist will be summoned from the nearest large city. He will arrive by airplane to take charge of the delivery.

3. In the more sparsely populated areas, babies will be born at the parents' home.

Instead of taking the mother to the hospital, the hospital will come to the home if the family doctor thinks there is trouble ahead.

The family physician will send an SOS to a nearby medical center. Thereupon an obstetrician, nurses and all equipment necessary for operative work will speed to the home in an especially built automobile that can travel all sorts of roads in all kinds of weather. There will be no charge to the patient. These medical centers, subsidized by the state or by some foundation, will serve persons living within a 75-mile radius.

Dr. Skeel outlines this threefold plan for future obstetrics in the 25th anniversary issue of *The Modern Hospital*, which reviews hospital achievements of the past quarter of a century and looks ahead to the next 25 years.

In criticism of present hospital care for maternity cases, Dr. Skeel finds the general hospital too often locks the barn door after the horse is stolen in the case of infections among the newborn. Larger nurseries and larger maternity housing units have been the order of the day. These may easily mean epidemics of sepsis and of infantile diarrhea, he says.

"Future building of maternity hospitals, either for specialized obstetrics or the obstetrical division of a general hospital, should be planned for small unit service only.

"With isolation to protect from external contamination and with the small unit plan to limit septic contacts by a rare case, arising sporadically, the hospital can provide patients greater safety than was possible before, either in the home or in the hospital," Dr. Skeel concludes.

Science News Letter, September 24, 1938

One person in every 14 in this country last year spent some time in a hospital.

Oklahoma City has remodeled 800 of its street corners to make it easier for automobiles to turn right.

MEDICINE

Sulfanilamide Seen As Scarlet Fever Preventive

SULFANILAMIDE, the drug discovery of the decade, has its place in preventing as well as in curing scarlet fever.

Take the case of the eleven English choir boys, one of whom contracted scarlet fever while in Chicago. He was taken to the municipal contagious disease hospital and then there were 10.

The 10 were given 20 cc. each of pooled convalescent scarlet fever serum. On the eighth day one of the group took scarlet fever; then there were nine.

Mild forms of scarlet fever and streptococcic sore throat seized four others and then there were five.

The final five remained well, the same five that had been given sufanilamide during the course of their isolation. The other six (who did not receive sulfanilamide) recovered after varying periods of convalescence.

The story of the 11 little choir boys is used by Drs. Wallace Sako, P. F. Dwan and E. S. Platou, of Minneapolis, (*Journal American Medical Association*, Sept. 10) in an article on sulfanilamide and serum in the treatment or prophylaxis of scarlet fever.

These doctors report:

1. Among 100 cases of scarlet fever treated with large doses of sulfanilamide, complications developed in eight. Among 100 similar cases in which the drug was not given, complications occurred in 41.

2. Scarlet fever is strikingly modified by early massive doses of anti-toxin contained either in human convalescent serum or commercial horse serum.

3. Human convalescent serum, although it has a lower antitoxic titer per cubic centimeter, has a distinct advantage over commercial antitoxin with respect to safety for intravenous use.

4. Pooled human convalescent serum (20 cc.) failed to prevent streptococcic invasion of scarlet fever in five of 10 boys who were intimately exposed to it, whereas five who received additional therapy (sulfanilamide) did not contract the disease.

5. Commercial antitoxin in their experience has failed to protect several persons against the streptococci invasion of scarlet fever.

6. Early massive intravenous serum therapy combined with continued large doses of sulfanilamide seems to be the most effective treatment for scarlet fever.

Science News Letter, September 24, 1938

BOTANY

Hormones for Plants Cause Rapid Sprouting and Growth

Chemicals Producing Strange Whiskers on Plant Roots Being Tested in Canadian Wheat Areas to Judge Value

HORMONE dust, a sort of magic face powder for seeds and plant cuttings, promises to speed agriculture in field and garden, as the result of investigations of the Canadian National Research Council.

Wonder-working synthetic chemicals that grow roots on seeds and slips of plants many days before they otherwise would sprout are now ground into talc and other inert dusts for easier and more effective application.

Experiments of Dr. N. H. Grace, NRC scientist, are being extended this year to large field trials of actual grain production in various parts of Canada.

The use of chemical stimulants, plant hormones they are called, is not new. For the past few years scientists and gardeners have been using such complex chemicals as naphthylacetic acid, indolylacetic acid and indolylbutyric acid, all synthetically made from coar-tar and other substances, for getting roots started faster and more vigorously. Roots can even be made to grow where they would not normally appear.

The Canadian improvement is in the manner of application. Instead of putting the hormone chemicals in water and applying them that way, they are distributed in fine dust. It is easier to roll the seeds in the dust and stick the cuttings in fine powder.

Plant Face Powder

The dust most often used is talc, the same sort of mineral that is used in making face powder in cosmetics. But charcoal and other inert dusts are sometimes used.

Wheat on the western plains may be able to get its roots in the soil faster and more securely if the seed wheat is dusted with hormones. In some cases this may mean the difference between getting a crop and not getting it. Winds are likely to blow the young sprouting seeds out of the ground if the roots do not anchor them speedily. Since the synthetic chemical treatment causes the roots to "dig in" promptly, wheat so treated may withstand wind and drought at an earlier time after seeding.

The hormone dusting adds practically nothing to the cost of the seeding operation. Farmers already dust their seed with poison to kill fungus, and it is only necessary to add the chemical hormone to the dust previously used. Demand is reducing the cost of these synthetic chemicals, and naphthylacetic acid costs about $10 per pound. Seed for several thousand acres can be treated with a pound. Thus the treatment costs only about half cent an acre.

Pioneers in plant hormone research were Drs. P. W. Zimmerman and A. E. Hitchcock of the Boyce Thompson Institute for Plant Research, Yonkers, N. Y., who in 1935 showed that some 16 new chemical substances would grow root "whiskers" upon plants, even in the most fantastic places, such as upon the flowers. They applied their chemicals as solutions in water or as salves.

Tiny Amounts Effective

Extraordinarily small amounts of the chemicals are needed. For instance, naphthylacetic acid is effective in a water solution containing one part per hundred million, and a single pound of it would make ten train loads, with each train of 100 tank cars, and every car containing 12,500 American gallons.

Dr. Grace has found that the dust application of the plant hormones spreads their effects over a longer period than is the case when they are applied in a water solution. The solution method has a single shot effect, so to speak.

For propagating plants by cuttings and for prompt rooting of seedlings, the plant hormone dust is also being used. Forestry programs may be speeded up materially by use of cuttings from trees made to root by the dust applications to the stems. Use of such cuttings instead of seedlings may result in a year or two of time being saved in getting trees started.

Some hope has been held out that the chemical treatment will, in addition to getting the plant well started earlier, increase yields and produce earlier ripening. But the investigators do not encourage the expectation of this result, preferring to await the results of field experiments now under way.

Farmers and gardeners will be using these new chemicals in coming years if the plant hormones live up to the promise. They will be talking glibly of these strange sounding chemicals. And no doubt the chemists and plant physiologists will be working out new chemicals to produce still more wonderful and more useful effects.

Science News Letter, September 24, 1938

ZOOLOGY

Woodpeckers and Man Studied in New Book

WOODPECKERS and man form the uniquely combined subject of a new book entitled, *The California Woodpecker and I*, written by Dr. William Emerson Ritter, honorary president of Science Service and professor emeritus of zoology at the University of California.

More specifically, as indicated by its title, the book is about one species of woodpecker and one individual man, the author himself. He made his study of the remarkable acorn-storing birds during several years of frequent trips and longer sojourns in the oak-covered hills of the Pacific Coast.

Unlike as they are in structure as well as in physical and mental functionings,

DIPPED

This is how scientists dust plant cuttings with chemical plant hormones to test effectiveness of treatment on growth. The cuttings are dipped into the can of plant hormone powder, and then, with powder adhering, are ready for planting.

LIKE BEARDS OF THE DWARFS

These are barley roots raised from seeds dusted with chemicals and then grown two weeks in non-nutritive sand. Left to right: roots from undusted seeds, roots from seeds dusted with 2.5 parts per million of naphthylacetic acid, roots from seeds dusted with higher, but less effective concentrations.

there are some curious parallelisms between California woodpeckers and human beings—even rather "advanced" human beings. Unlike other woodpeckers, the California species is decidedly socialized—almost a communist in some respects.

The bird is an acorn-storer, jamming the nuts into holes which it drills into trees, telephone poles, and buildings. But the enterprise is communal: the woodpeckers all store their acorns in the same tree trunk, and help themselves at will when they are hungry. They act together to drive off marauding squirrels that would steal the stores.

Instead of working strictly in pairs to chisel out holes for nesting, they labor in little groups of threes and fours. Even in feeding the young, there may be supernumerary adults on the job. Also, they excavate a different type of hole, not used for nesting but for "residence," into which as many as half-a-dozen may occasionally crowd themselves.

For all their prudence in gathering into barns, the California woodpeckers are by no means always wise. They will drop acorns into hollow places where they can't recover them. They will lay up far more food than they are ever likely to use. And they will carefully store such things as pebbles—which they can no more eat than we can eat gold bars.

Science News Letter, September 24, 1938

HYGIENE

New Health Phrase: Vocational Hygiene

A NEW phrase and a new viewpoint about health have put in their appearance. The phrase is "vocational hygiene," which is the title of a new book by Daniel Caplin, assistant director of health education for New York City, and S. G. Ocean, acting chairman of the health education department of the Murray High School in the same city.

The point about this phrase and the book itself is that the innumerable discussions and studies of industrial hygiene and occupational diseases have nearly all been undertaken from the viewpoint of having outside agencies—health departments and industrial concerns—protect the worker's health.

The Caplin-Ocean book, while not minimizing the importance of this type of health protection, approaches the subject from a different angle and tells what the worker himself can and should do to protect his health. The book is designed as a text for vocational schools, but seems worth even wider reading and study.

Diet, fatigue, posture, personal cleanliness, recreation, outdoor exercise and safe working habits are health factors which no employer, however well-intentioned, and no health officer, however vigilant, can do as much about as the worker himself.

Safety devices and protective appliances—goggles, for example, and respirators—do not protect the worker nor prevent accidents if they are not used, or are used incorrectly. When first aid kits and medical departments are provided, it is still up to the worker to use them to prevent infection if he cuts his finger or gets a cinder in his eye.

Part of vocational hygiene, it appears from the book, is the proper use of tools to prevent accidents. Another part is the wearing of suitable clothing while on the job. Both a loose cuff and a dangling necktie seem obvious hazards but probably their very obviousness causes them to be forgotten at times.

Science News Letter, September 24, 1938

AVIATION

Device Shows Dispatchers Direction of Incoming Planes

A NEW device which, by determining the direction from which an approaching airplane's radio transmitter is sending signals, enables airplane dispatchers to know the direction of approach of incoming planes though weather conditions may make the planes invisible has been developed by scientists of the Bell Telephone Laboratories.

Intended as an additional safeguard for private and commercial radio-equipped aircraft, the new device locates a tiny green light speck on a frosted glass screen in accordance with the direction from which the plane is coming. The points of the compass are marked around the screen's edge.

The system provides for indications on any ten wavelengths which may be selected remotely. As each pilot talks to the control tower at his destination, the spot of light waves moves instantly to its correct position on the screen of a cathode ray tube. A pick-up antenna of special design is employed; this may be situated at any remote point. A single telephone line connects antenna and dispatcher.

Science News Letter, September 24, 1938

ECOLOGY

Timberline Trees Show Effects of Snow Blasts

See Front Cover

SERENE autumn reigns in the lowlands, but high on the ranges in the West winter has already come. Snow has fallen among the trees of timberline, and soon their wrestling with winter storms in full fury will begin.

The distorted, one-sided, half-stripped appearance of trees near mountain timberlines is not due primarily to their being just pushed around by the prevailing winds. When hard-frozen snow lies on the ground, these gales sweep myriads of angular little ice pellets against them, like a sandblast. It is these innumerable teeth of ice that gnaw away leaves, twigs, even bark on the windward sides of the trees, and permit growth to proceed only down the wind. Cover photograph is from Denver, Colo.

Science News Letter, September 24, 1938

PHYSICS

Shells "Go to Sleep" During Swift Flight

ARTILLERY shells, screeching through the skies in Spain and China, "go to sleep" during their journey.

Probably most of the people at the receiving end of these death-dealers won't believe that, but it is true. In this skepticism they may be joined by those members of the A. E. F. who were actually under fire. But shells do "sleep" in flight, and without this sleep their range would neither be as great nor as true.

Sleeping in projectiles refers to the position in space which they take up because of the terrific spin produced by the rifling in the barrel of the gun. No one, of course, has ever seen a sleeping shell, but most everyone has seen a top go to sleep when it is spun rapidly.

When spinning rapidly a top will stay vertically upright if resting on a level surface. Only when the spin dies down does the top begin to wobble.

R. H. Kent, ordnance engineer at the Aberdeen Proving Ground of the U. S. Army, in Maryland, points out in the *Journal of The Franklin Institute* (July) that projectiles without sufficient spin will also go into a wobbling state just like a slow-spinning top.

The spin, produced by the rifling, Mr. Kent states, makes the nose of a projectile cock up as much as ten degrees, in some cases, as the shell leaves the gun. This yaw would produce wobbling if the centrifugal force of spin did not overcome it and make the shell settle down to sleep.

"Fortunately, however," he adds, "just as a top goes to sleep about the vertical when spun on a table the projectile tends to go to sleep on its trajectory. If it did not go to sleep in this way, the range obtained from ordinary projectiles would be very appreciably reduced."

Science News Letter, September 24, 1938

SURGERY

Mending Bones Still One Of Surgeon's Chief Jobs

IN THESE days when so much is heard about gall bladder operations, surgical cures of cancer, gland grafting and plastic surgery, it is interesting to find that setting broken bones, one of the earliest jobs tackled by surgeons, is still one of their most important, numerically speaking.

Setting of fractured bones stands second in order of frequency, coming right after removal of tonsils, it appears from a statistical study by Selwyn D. Collins of the U. S. Public Health Service's National Institute of Health. Mr. Collins obtained his figures from a canvass of 8,758 white families living in 130 localities in 18 states of the union. The canvass covered a period of 12 consecutive months between 1928 and 1931.

For every 1,000 persons in this group, 65 surgical operations were performed in a single year. This means the total number of operations in this country each year totals close to 1,000,000. Of these, removal of tonsils constitutes nearly one-third. Setting of broken bones and other operations in connection with injuries take second place and third place respectively and together account for one-fifth of all operations. Operations on female organs of reproduction are fourth in order of frequency and removal of the appendix came fifth.

Slightly more operations are performed on women than men. Setting broken bones and other operations in connection with injury, hernia and sinus operations are more frequent in men. Appendectomy, gallbladder, cancer and thyroid operations are more frequent in women.

As might perhaps be expected, the frequency of operations increases with income. There is some difference, too, in types of operations according to income. You have to be up in the higher brackets, it appears, before removal of tumors and ear and mastoid operations are undertaken frequently.

Science News Letter, September 24, 1938

IN SCIENC

ASTRONOMY

This Year Equinox Comes Exactly at Noon, E.S.T.

UNIQUE among equinoxes is this year's ushering in of autumn, on Friday, Sept. 23, at exactly 12:00 noon, E.S.T. (11:00 a. m. C.S.T.; 10:00 a. m. M.S.T.; 9:00 a. m. P.S.T.). The U. S. Naval Observatory states that it is a most exceptional occurrence.

The autumnal equinox marks the time when the sun's apparent southward migration through the sky brings it exactly over the equator. Day and night are then each just twelve hours long—the word equinox itself comes from a Latin phrase meaning "equal night."

Any stormy weather that may occur at this season should not be dubbed "the equinoxial storm," scientists agree. There are likely to be storms at any time in autumn, but they come and go without regard to the sun's astronomical position.

Science News Letter, September 24, 1938

ASTRONOMY

Leading Soviet Astronomers Reported Imprisoned

LEADING Soviet astronomers evidently have been "purge" victims.

The British science journal *Nature* (Aug. 27), reports that the Polish journal, *Acta Astronomica,* states that the following staff members of the Pulkovo Observatory have been imprisoned: I. A. Balanovsky, N. I. Dneprovsky, B. P. Gerasimovic (director), P. I. Iaschnoff, N. W. Zimmermann. B. W. Noumeroff, director of the Astronomical Institute at Leningrad, is believed to have been shot.

Gerasimovic was chairman of the commission of the Academy of Sciences of the U. S. S. R. in connection with the 1936 eclipse of the sun observed from Ak-Bulak and as such was host of the Harvard-Massachusetts Institute of Technology expedition there. Balanovsky led the expedition from Pulkovo Observatory to the same eclipse.

No Soviet astronomers were in attendance at the recent meeting of the International Astronomical Union at Stockholm, although delegates had attended previous meetings.

Science News Letter, September 24, 1938

ICE FIELDS

ANTHROPOLOGY

Future American Women Expected To be Taller

THE TYPICAL American woman of the next generation will be taller than the average American woman of today, but her height will probably not exceed 5 feet 4 inches. The increased heights of present generation college women over those of their mothers is the chief basis of this estimate by Metropolitan Life Insurance Company statisticians. The daughters have gained a little over one inch in height.

Life insurance figures have only recently begun to show any increase in average height of women in this country. The increase shown in these figures is among younger women and seems to be the result of several forces. Among them are the curtailment of immigration since the World War, improvement of conditions such as undernutrition and disease among descendants of later immigrants, and mingling of racial types due to intermarriage.

Science News Letter, September 24, 1938

PSYCHOLOGY

If You Are a Little Queer You Are Probably Normal

DOES your mind play tricks on you? Do you have strange fears or worries that have set you to wondering whether your mind was all right?

If so, you will be glad to know that many another person feels the same way.

In an article in *Hygeia* (September), Dr. Stephen Habbe, director of the WPA Adult Guidance Service of New Haven, Conn., tells how normal it is to have some little quirks of mind—some abnormality.

We take for granted the many little physical abnormalities that all must suffer. We think nothing of toothaches or colds, or being tall or thin, or wearing glasses.

Perhaps we worry about our mental peculiarities mainly because we can't see into our neighbors' minds. The physician who treats sick minds can tell you that such oddities are common.

The feeling of inferiority is called by Dr. Habbe a favorite mental torture. But if some of our friends are better looking or can think faster than we can, it is also true that we are better in these respects than some of our other friends. And, fortunately, everybody tends to run with a crowd that is just about his own speed.

Mood swings are another experience shared by all. Dr. Habbe advises that you avoid making important decisions when you are either far up or down, and think of your problems with a long-time view.

People fear the oddest things. If you are afraid of snakes, or of canned goods, or grasshoppers, or bicycles, you are just one of a number of your fellow men. Many are unable to trace the origin of their fears.

Some fears, Dr. Habbe emphasizes, you would not want to be rid of if you could. Fears of taxicabs and unsteady ladders are very useful to those who would remain alive.

Many other normal abnormalities are listed for your reassurance by Dr. Habbe. They include: sleep disturbances, suicidal impulses, feeling of impending insanity and religious perplexities and even sex "perversions."

We are all a little queer.

Science News Letter, September 24, 1938

PSYCHOLOGY

Old Minds Rejuvenated By Sex Hormone

OLD MEN can be made young again, mentally as well as sexually, by means of hormone injection, Dr. Neal E. Miller, of the Institute of Human Relations, Yale University, told American Psychological Association.

Elation takes the place of depression in most of the patients, Dr. Miller observed in the course of an experiment in which the effect of injection of the hormone testosterone proprionate was compared with results of a similar injection not containing the hormone. The group included, in addition to the cases of old men being rejuvenated, a number who were suffering from various types of glandular deficiency. Improvement was greatest when the deficiency had been greatest. Rational aggressiveness took the place of irrational irritability, for some patients. Nervousness and emotional instability were decreased. Muscle tonus, energy and stamina returned. Emotionally and sexually they were in better condition.

The psychological improvement did not take place after the dose not containing the hormone.

Science News Letter, September 24, 1938

PSYCHOLOGY

Salesman May Not Have Had Aggressiveness At Start

SELF-CONFIDENT, go-getter types of men do not always make the best salesmen, but many successful salesmen do develop an aggressive, self-reliant attitude as a result of their success, Dr. Arthur W. Kornhauser, of the University of Chicago, told Science Service in discussing modern methods of scientific personality judging.

The latest findings in this field were recently the subject of debate in a symposium of the American Association of Applied Psychologists, of which Dr. Kornhauser was chairman.

No simple objective test now exists which will tell an employer whether the man he is hiring is honest or industrious or a good salesman, psychologists in this field agree. Measurement of character must, at present, be conducted in a roundabout way by means of questionnaires and records of the man's job and personal history. Latest refinements of such indirect methods were discussed.

Psychologists may ask a man what he thinks of Federal aid for the unemployed, or the boycotting of goods from warring nations, or similar debatable current topics. The object is not really to find out the man's opinions, but how sure he is of his ideas—how positively he expresses himself. This is a clue to the man's self-confidence.

Some personality tests are successful even when the person knows he is being tested, provided too much does not depend upon passing the examination. Consequently they work better in selecting men for jobs where the pay is on a commission basis only rather than for salaried jobs.

Science News Letter, September 24, 1938

PHYSICS

Liquid Helium Film Only Quarter-Millionth Inch

HELIUM II, one form of liquid helium that is so fluid it behaves almost like a gas, forms about the thinnest liquid films that scientists have yet been able to produce. A. K. Kikoin and B. G. Lasarew, of the Ukrainian Physical-Technical Institute in Kharkov, report that they have produced films of the cold substance so thin that it would take a quarter of a million of them piled up to measure an inch in thickness. (*Nature*, Aug. 13)

Science News Letter, September 24, 1938

ASTRONOMY

Two Planets Shine

Jupiter and Saturn Now Visible in Evening Skies; Former Now Leads in Number of Her Known Moons

By JAMES STOKELY

VENUS is now the most brilliant star or planet in the evening sky, but it is so far south that it is not easy to see, and sets about an hour after sunset. Thus, it does not appear on the accompanying maps, which show the appearance of the heavens at 10:00 p. m. on October 1, 9:00 p. m. on the 15th and 8:00 p. m. on the 31st. However, if you look towards the southwest soon after the sun goes down, you should be able to see it in the accumulating dusk.

But even without Venus, evenings of the present month bring us two planets. Towards the south, in the constellation of Capricornus, the sea-goat, shines Jupiter, second brightest planet, of magnitude minus two, about a sixth the brilliance of Venus. The other planet is Saturn, which is in the southeast, in the figure of Pisces, the fishes. Its magnitude is 0.4, only about a tenth the brightness of Venus, but brighter than any star now seen, with one exception. This is Vega, in the constellation of Lyra, the lyre, high in the west. Vega, of course, shines with its own light, while the planets are dark bodies, revolving around the sun, whose reflected light makes them visible.

Of the two remaining naked-eye planets, Mercury is this month too close to the sun to be visible at all. Mars, now distant and faint, might be glimpsed in the east before sunrise, in the group of Leo, the lion.

Vega Brightest

Vega is the brightest star now seen. Above it is Cygnus, the swan, with first magnitude Deneb. Nearby, to the south, is Altair, in Aquila, the eagle. Low in the northeast is Capella, of Auriga, the charioteer. Next to this group, to the right, is part of Taurus, the bull, with Aldebaran. A sixth first magnitude star of the October evening is Fomalhaut, of Piscis Austrinus, low in the south.

Visitors looking through the telescopes of an observatory find the planets Jupiter and Saturn probably the objects of greatest interest, with the possible exception of the moon. Jupiter has the ever-changing belts of cloud which seem to duplicate the imaginary parallels of latitude on a globe of earth.

The very remarkable system of rings of Saturn is its most attractive feature. These are a swarm of tiny moonlets, perhaps the remains of a larger moon that the planet once had. According to theory, this unfortunate satellite ventured too close to the planet, the attraction of which set up inside it enormous tidal forces. With the part nearest Saturn pulled far more than the other hemisphere, the moon was torn asunder, and the rings, now revolving in the old orbit of the moon, are the remains.

This may forecast the ultimate fate of our own moon, for this same theory supposes that it will, in the distant future, approach too closely to us, and similarly disintegrate into a ring system around the earth.

Would Leave Lovers Bereft

This would then leave us moonless. Saturn was better able to afford the loss of one of its satellites, for it has nine others that can still be observed. Until last year, in astronomers' tables, it was tied with Jupiter, which also had nine moons, but now that planet has forged ahead. Two new Jovian moons were discovered during the past summer.

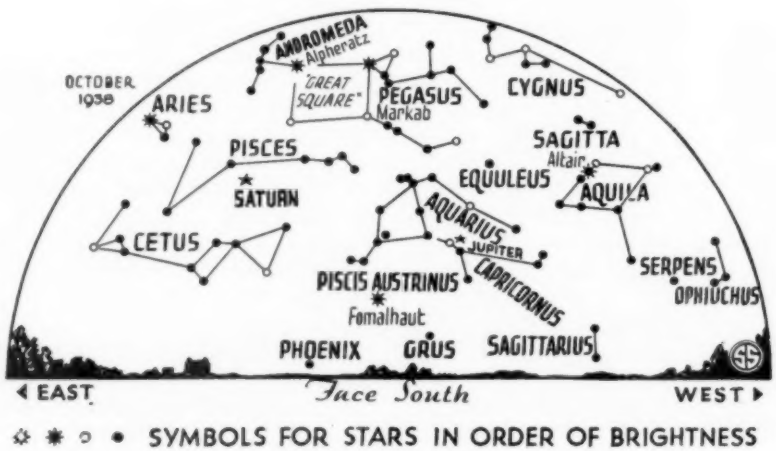
The history of the discovery of these moons makes an interesting epitome of the progress of astronomical observation. Jupiter itself was known to the ancients, but they had no idea that it had any such attendants. During the first decade of the 17th century, the telescope was invented by a Dutch spectacle maker, who, however, seems never to have realized that it might have astronomical possibilities.

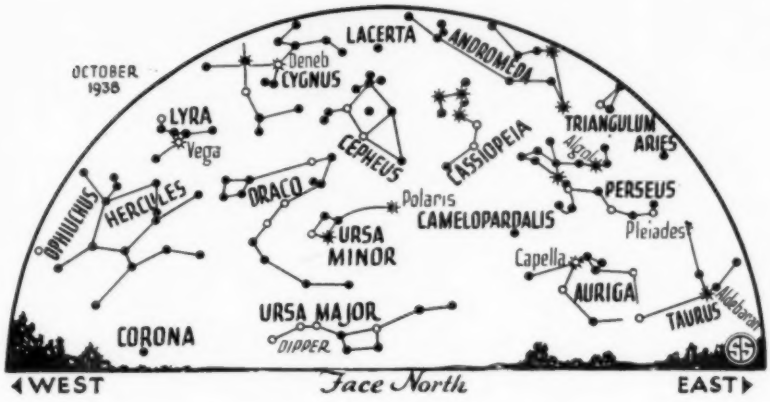
First Discovery

At the end of 1609, Galileo Galilei, an Italian astronomer, heard reports of this device. From his own knowledge of optics, he figured out how to make one, which differed somewhat from the Dutch instrument. On Jan. 7, 1610, he turned his little instrument, only about two feet long, on Jupiter, and found near it what he first supposed to be faint stars. But, as he looked on succeeding nights, he found that these objects, four in number, seemed to be moving around Jupiter. This proved that they were not stars, but satellites, and so the first astronomical discovery with the telescope was made.

Later they were given names, Io, Europa, Ganymede, and Callisto, in order of distance from Jupiter. They are about the sixth and seventh magnitudes, too faint to be seen with the naked eye, especially in the glare of the bright planet.

After Galileo announced his discovery, a German astronomer, Simon Marius, tried to take the credit. It seems that he had actually secured a telescope a year or more before Galileo made his, and with it had observed the satellites. But, he did not realize what they were until after Galileo's publication of his discov-





ery. Accordingly, history's verdict gives Galileo undisputed credit.

The following years brought the discovery of eight moons of Saturn, four of Uranus, two of Mars, and one of Neptune, but Jupiter had to remain content with four until the building of the Lick Observatory in California. In 1892, Dr. Edward E. Barnard took a photograph with one of that institution's great telescopes, which revealed the fifth satellite. No name has ever been given to this little body, which is much smaller than the four of Galileo, and is only about half as far from the planet as Io. Its magnitude is 13, so that a good-sized telescope is needed to see it.

In the winter of 1904-5, Lick Observatory again contributed, when Dr. C. D. Perrine found two more, known merely as six and seven. Their magnitudes are 14 and 16, still fainter than Barnard's No. 5. In 1908, England scored for the first time, when Dr. P. J. Melotte, at the Royal Observatory, Greenwich, found No. 8, of magnitude 17.

The eighth proved very difficult to see, and satisfactory observations of it were very meager. In 1914, Seth B. Nicholson, a graduate student at the University of California, was doing work for his doctor's degree at the Lick Observatory, and decided to make the eighth satellite the subject of his thesis. Therefore, he had to photograph it, and when he did he found a strange object on one of the plates. This turned out to be satellite No. 9, of magnitude 19. The following year he received his doctorate, and joined the staff of the Mt. Wilson Observatory.

There, the sun, and studies of the heat radiation of the stars and planets, have engaged his attention for most of the time. But during the past summer he returned to his old love, Jupiter, and made a survey of the planet and its moons. The eighth satellite, elusive as ever, had been "lost" for many years, but he found it again at the end of July, using the 100-inch telescope, the world's largest.

Then, as he studied his plates, he found several strange objects. One turned out to be an asteroid, one of the family of tiny planets moving between Mars and Jupiter. But two others proved to be new Jovian satellites, numbers 10 and 11! They also are of the 19th magnitude, so that only a very few of the world's telescopes are capable of showing them. There is no doubt but that they are real moons. Thus, Dr. Nicholson's score is now only one behind that of Galileo, while Jupiter easily leads in the size of its retinue.

As for our own moon, the table below indicates its phases. Twice this month it will recede from the earth to its greatest distance, when we say that it is at apogee. On Oct. 2, at 6:00 a. m., E.S.T., it will be 251,200 miles away, and on Oct. 30, at 2:00 a. m., E.S.T., it will be at a distance of 251,300 miles. But on the 16th, at 3:00 a. m., it will be at perigee, only 230,000 miles distant. On the night of Oct. 30, also, persons throughout the United States, except in the western part, will see it hide, or "occult," the third magnitude star beta Capricorni. It will then be almost at first quarter. At Washington, the star will pass behind the bright edge of the moon at 11:53 p. m., E.S.T., while it will emerge from the dark edge at 1:13 a. m., E.S.T., on the 31st. For other parts of the country, the times will be a little different. A telescope, or a pair of binoculars, will help reveal the star when close to the moon.

Phases of the Moon

		E.S.T.
First quarter	Oct. 1	6:45 a. m.
Full	Oct. 9	4:37 a. m.
Last quarter	Oct. 16	4:24 a. m.
New	Oct. 23	3:42 a. m.
First quarter	Oct. 31	2:45 a. m.

Science News Letter, September 24, 1938

PSYCHOLOGY

Expert Asks Why Reading Should Be Taught to All

WHY learn to read?

Modern invention is fast minimizing the need for ability to recognize the printed word. The radio has done away with need for reading the newspapers; even the comic strip is presented over the air. Fiction comes to you in sound movies.

You can now buy excellent magazines containing whole stories in pictures. Even if you are a historian, important events are recorded for you in motion pictures. The voices of great men may bring their messages to you on sound film or phonograph records.

Even the letters of friendship or business may soon be outdated by mailable dictating machine records on which the sender can speak directly to his correspondent.

Seriously, it is proposed by Dr. Arthur Lichtenstein, of the Johns Hopkins University, who has had the problem of teaching reading to those who cannot learn, that we modify the school curriculum so as to lighten the burden for those lacking in literary aptitude.

The story of Rae is told by Dr. Lichtenstein in *School and Society,* where this revolutionary proposal is made.

Rae was a "nice, friendly boy, making every effort to succeed, and a great help around the home."

Normal IQ

Rae's troubles were due to the fact that at ten years he was unable to pass the second grade reading test. Despite this handicap his intelligence was normal. Every effort was made to teach him to read.

Four years later his IQ had dropped 15 points. He had gained 18 months in mental age in the four years and in silent reading he had lost two months.

"The time spent in attempting to make a reader of Rae was wasted," comments Dr. Lichtenstein. "Fortunately, no greater harm to his personality appeared to result than the development of a marked inferiority feeling and dislike and apprehension in the presence of a reading situation.

"Had reading been relegated to a minor place in his program instead of the all-powerful bugbear it became, he would be just as well off educationally and far better off from a mental hygiene point of view."

Science News Letter, September 24, 1938

PSYCHOLOGY

Government Begins Projects In Psychological Research

1—Forest Fire Setting Seen as a Human Problem
2—Mental Health Survey Is Begun in Kentucky

NOW psychology is to be used to fight the devouring flames of forest fires.

Uncle Sam's fire fighters have tried water and shovel and backfire. They have experimented with chemical extinguishers and smothering gases. They have used airplanes as part of their fire-fighting equipment.

Now they are ready to try a new weapon—they hope to put out some of these fires at their source through an inquiry into the minds of the human beings who set some 155,000 forest fires every year in the United States, including the "firebugs" responsible for 43,000 blazes of deliberate incendiary origin.

A call for cooperation from leading psychologists was issued at the meeting of the American Psychological Association by Dr. John P. Shea, of the Adult Education Society, Kansas City, Mo., who has already been called into consultation by the U. S. Forest Service and who has made a preliminary survey of the problem. On the part of the Forest Service he urged formation of an advisory council of psychologists, sociologists and educators for a massed attack on the problem.

Superstitions, folk ways and traditions, almost akin to fire-worship and tracing their origins back to dim antiquity are responsible for the loss of millions of acres of forests each year in this streamlined age in America.

"Large groups of (*Turn to Page 206*)

AT PRESENT filling more hospital beds than all other diseases combined, mental illness has been recognized by the U. S. Public Health Service as a medical-social-economic problem of national scope and demanding coordinated, cooperative attack. Ways in which psychologists can aid in studying underlying causes of mental illness and the social conditions prejudicial to mental health were discussed at the meeting of the American Association of Applied Psychology. The problem is also being presented with a request for cooperation to psychiatrists and sociologists.

At the psychology meeting, Dr. L. M. Rogers, director of field studies in mental hygiene for the United States Public Health Service, outlined the campaign planned by Uncle Sam for a fundamental attack on the social and economic conditions that at present form a hazard for America's mental health.

Lexington, Ky., has been selected by the Public Health Service as a typical American community for intensive study of this problem. At a diagnostic and consultation center there are registered the individual mental health problems of the community. To this center men and women, boys and girls, needing psychological aid, are sent by social agencies, private physicians, teachers, judges, individuals and by officials of the University of Kentucky, which is located at Lexington.

Thus a cross section of the mental health problems of this sample American community is gradually being built up. In connection with the study of these individual cases, a detailed investigation of the social and economic conditions of the community is being made, especially as they bear on individual maladjustment. It is in connection with this sort of investigation that the Public Health Service expects particular aid from the psychologists.

Appointed chairman of a committee of psychologists to cooperate with the U. S. Public Health Service is Dr. J. B. Miner, who as head of the department of psychology and director of the personnel bureau of the University of Kentucky, is in close touch with the Health Service Mental Hygiene Survey in Lexington.

This survey is not a part of the National Health Survey, which has been assaying America's health resources, but is a separate program designed to promote mental hygiene and dig out the facts regarding the obscure origins of mental illness.

Science News Letter, September 24, 1938

ASTRONOMY

Seven Miles Are Added To Venus' Diameter

NEW measurements have added seven miles to the diameter and 12,000,000,000,000,000,000 tons to the weight of that old gal up in the sky so few of us ever see—Venus.

The American Astronomical Society heard this from Dr. H. R. Morgan and F. P. Scott, of the U. S. Naval Observatory in Washington, D. C., who have just completed redeterminations of the planet's mass from a study of the disturbances it effects through gravitation on the motions of the earth itself.

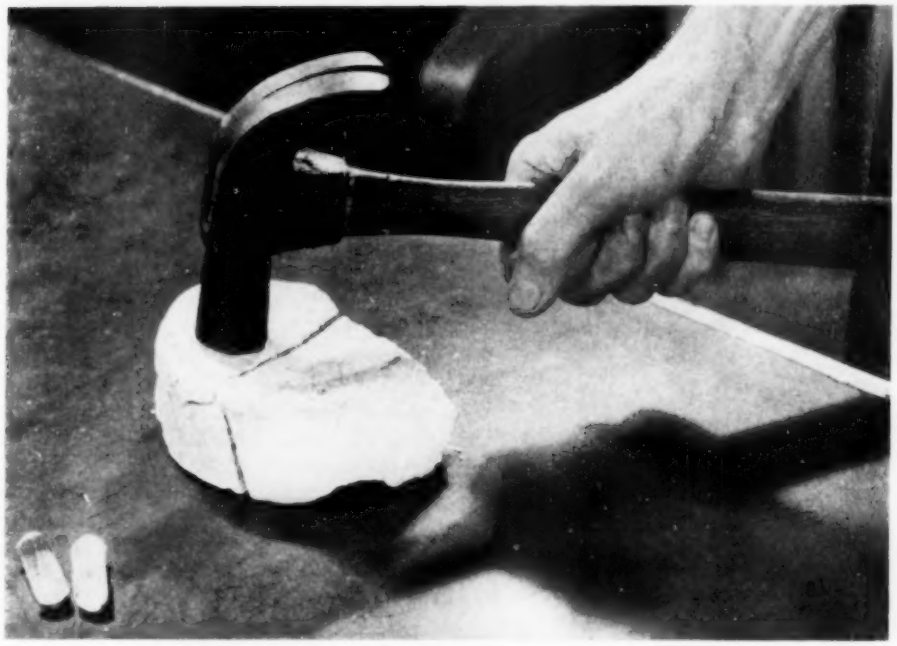
New calculations, the two astronomers said, indicate that the ratio of its weight to that of the sun is 1 to 407,000 instead of 1 to 408,000, as previously believed. This represents for the planet, whose size is approximately the same as the earth, a weight increase. Naturally, its volume is also increased—by 700,000,000 cubic miles.

They also calculated that the earth is 81.26 times as massive as the moon, from a similar study of the motions of the earth and moon.

Science News Letter, September 24, 1938

Georgia peaches are being de-furred by electricity.

Chinese artists can paint on paper made from rice straw, reed, hemp, or mulberry bark, but they like bamboo pulp paper best.



HARD

Several hammer blows were required to break the block of boric oxide formed into crystals at the Westinghouse Research Laboratories. In the foreground are two samples of its relative, boric oxide glass, shattered by a single blow.

PHYSICS

Accidental Discovery Leads To New Form of Crystal

AN ACCIDENTAL discovery in a research laboratory has led to the discovery of a new crystalline state of boric oxide which promises to change certain commercial glass manufacturing methods.

Leon McCulloch, research engineer of the Westinghouse Electric and Manufacturing Company, recently fused some boric acid in a tin can in an oven, trying to keep the mixture liquid so that it could be used to impregnate electrical coils and insulate them.

But the mixture turned white and milky and then pasty. Finally it turned stonelike and about as hard as Portland cement.

Such a mass was useless for insulation purposes but Mr. McCulloch began to study its properties. On weighing, it was found to have a specific gravity one-third greater than the comparable boric oxide glass. Moreover, its crystal structure was revealed by a definite melting point and by X-ray studies. In contrast, its relative boric oxide glass has no fixed melting point and does not exhibit a characteristic crystalline X-ray spectrum.

What happened, it now appears, is that the tin can and the hot oven changed the boric acid to a crystalline state just as flavored sugar syrup changes to fudge on boiling.

Boric oxide glass plays an important chemical and industrial role because of its high resistance to heat shock. The new discovery, it is claimed, should prove helpful in commercial glass manufacture, perhaps supplanting boric oxide glass in a number of processes.

The accidental discovery, made in an age when modern research is planned to the last detail, is reminiscent of Goodyear's classic discovery of vulcanization by the dropping of rubber and sulfur on a hot stove.

Science News Letter, September 24, 1938

Germany has developed a new vaccine for foot-and-mouth disease, which is ravaging cattle in that country.

BOTANY

NATURE RAMBLINGS

by Frank Thone

Bandaging Before Amputation

IF THE doctor cuts off your thumb (or your nose, or your leg) he bandages you up afterwards. But a tree performs thousands of amputations upon itself every autumn—and puts on the bandages before each operation!

The loss of each leaf is a little amputation to the tree. It is not like trimming your nails or cutting your hair. These are dead parts of ourselves, and we can cut them off without pain or loss of blood, just as a tree can have its outer bark cut or knocked off without losing any of its sap.

But a leaf is a living part of the tree itself, with sap-channels and other vital connections running back into the trunk. If it is cut or pulled off there is a loss of sap, just as there is loss of blood if you get a slight cut or scratch.

Loss of one or a few leaves is not serious to the tree, any more than a few scratches are serious to you. But ten thousand, or a hundred thousand, such small wounds could bring serious consequences, not only through sap leakage, but even more seriously, through leaving all those tiny openings through which fungi, bacteria, and other organisms of injury and decay could find their way in.

So when autumn brings the slow decline of the leaves' vital activities and it comes time for their death and the myriad little amputations that part them from the tree, the event is well prepared for beforehand.

First, there is a gradual withdrawal of the larger part of the valuable foodstuffs in the leaves. The sugars and proteins migrate down the petiole or leaf-stem into the wood of the branches and trunk.

Then the bandage is applied. Across the base of the leaf-stem there forms a double layer of corky cells. They are waterproof, impervious to microbes. They put a tight seal across the place where the petiole is set into the twig.

This little corky barrier is called the absciss layer, which is Latin for "cutting-off layer." And that is exactly what it is. The split between leaf and tree comes at just that point. When the amputation is accomplished the bandage can be found already securely in place.

Science News Letter, September 24, 1938

From Page 204

people burn their forests, regularly—even 'religiously'," declared Dr. Shea. "The motives may be found in a study of group psychology. Studies are needed involving both the habits of individuals and the folk ways of groups—their attitudes, economic needs, customs, mores, superstitions."

The careless smoker and camper are guilty of some of the destruction of our forests by fire, but should not take all the blame, he indicated.

"The problem of forest burning is primarily a problem of human behavior," Dr. Shea said. He urged psychologists to cooperate immediately in its solution.

"It is a race between public education and disaster," he declared. "Ways must be found to change public attitudes and habits.

"Like falling cards knocking down their neighbors, where forests are burned the soil goes down, when the soil goes down the people go down. The paradox is that Americans are doing this to themselves."

Science News Letter, September 24, 1938

• Radio

Every Friday at 7:30 p. m. EST, 6:30 p. m. CST, 5:30 p. m. MST, or 4:30 p. m. PST, Science Service cooperates with the Columbia Broadcasting System in presenting over the Columbia coast to coast network "Adventures in Science" presenting discussions by eminent scientists.

•First Glances at New Books

Additional Reviews On Page 208

Ichthyology

FIELD BOOK OF FRESH-WATER FISHES OF NORTH AMERICA NORTH OF MEXICO—Ray Schrenkeisen—*Putnam's,* 312 p., illus., $3.50. An exceedingly worthwhile addition to the Putnam Field Book series. This is a book that will appeal not only to the naturalist; the angler will find it useful to slip a copy into his pocket, so that he can identify an unexpected catch, particularly if he is fishing in unfamiliar waters.

Science News Letter, September 24, 1938

Forestry

SOUTHERN FORESTRY—Charles N. Elliott—*Turner E. Smith,* 494 p., $1.60. The South has great forest wealth, and used to have wealth that was greater still. Conservation of what is left, restoration of what has been lost or wasted, is the task of the generation of boys and girls who are growing up along with the new trees. This book is designed to teach enough forestry to enable a Southern farmer to manage his wooded land intelligently, and at the same time to lay the foundation on which more detailed courses can be built for those who intend to become professional foresters.

Science News Letter, September 24, 1938

History—Biography

THE SILVER MAGNET: FIFTY YEARS IN A MEXICAN SILVER MINE—Grant Shepherd—*Dutton,* 302 p., illus., $3. Silver mining in Chihuahua, with the story beginning back in the 'eighties: this background supports an interesting, discursive narrative, naturally with plenty of thrills and adventure, set off by sympathetic feeling toward the Mexicans not too common in American mining engineers, and spiced with crackling bits of humor.

Science News Letter, September 24, 1938

Botany

FLORA OF COSTA RICA—Paul C. Standley—*Field Museum,* 363 p., $2.50. A worthy addition to the gratifyingly increasing literature on Central American flora, which will make life considerably more agreeable to botanists traveling in those lands or working on herbarium material that has originated in them.

Science News Letter, September 24, 1938

Biology

EXPERIENCE UNITS IN BIOLOGY—J. Frank Faust and George R. Biecher—*Stackpole Sons,* 404 p., $1.60. A book of projects for pupils in biology, divided into such "experience groups" as Building a Museum, The Human State, Nature's Reserve Bank, etc.; minutely outlined, and well provided with reference lists. Teaching biology on this basis is an ideal method, provided classes are not unwieldily large.

Science News Letter, September 24, 1938

Anatomy

AN INTRODUCTION TO VERTEBRATE ANATOMY—Harold Madison Messer—*Macmillan,* 406 p., illus., $3.50. A textbook intended for a one-semester course in colleges. The aim has been to keep down the amount of material presented without omitting anything really essential.

Science News Letter, September 24, 1938

Psychology

INTRODUCTION TO GENERAL PSYCHOLOGY—James B. Stroud—*Prentice-Hall,* 681 p., $3.25. A textbook for college students from Kansas State Teachers College of Emporia.

Science News Letter, September 24, 1938

Psychology

CHILDREN WITH DELAYED OR DEFECTIVE SPEECH—Sara M. Stinchfield and Edna H. Young—*Stanford Univ.,* 174 p., $3. Teachers and the parents of children with speech defects will find much of interest in this book discussing the problem and also practical therapy. The authors are at the University of Southern California and the Hill-Young School of Speech.

Science News Letter, September 24, 1938

Psychology

PSYCHOLOGY IN EVERYDAY LIFE—Walter C. Varnum—*McGraw-Hill,* 444 p., $2.75. A non-technical book designed to make available practically useful facts in this field for the benefit of the student who does not intend to go further with the study. The author is on the faculty of the Los Angeles Junior College.

Science News Letter, September 24, 1938

Ornithology

LIFE HISTORIES OF NORTH AMERICAN BIRDS OF PREY (PART 2): ORDERS FALCONIFORMES AND STRIGIFORMES—Arthur Cleveland Bent—*Govt. Print. Off.,* 482 p., 92 plates, 60 c. U. S. National Museum Bulletin 170.

Science News Letter, September 24, 1938

Geology

OUTLINE OF HISTORICAL GEOLOGY—A. K. Wells—*Nordemann,* 266 p., illus., $3.50. A cleanly-done textbook, intended primarily for use in England.

Science News Letter, September 24, 1938

Sociology

A NEW DEAL FOR YOUTH: THE STORY OF THE NATIONAL YOUTH ADMINISTRATION—Betty and Ernest K. Lindley—*Viking,* 315 p., illus., $3. The problems assailing youth growing up in an age of unemployment and economic uncertainty are those being attacked by the NYA. Here is the story of what is being attempted and accomplished.

Science News Letter, September 24, 1938

Physiology

HANDBOOK OF PHYSIOLOGY AND BIOCHEMISTRY (35th ed.)—W. D. Halliburton and R. J. S. McDowall—*Blakiston's,* 973 p., $5.50. Even the briefest glance through this text catches many practical features that show how well it must fulfill its purpose of meeting the needs of medical students preparing for examinations.

Science News Letter, September 24, 1938

Anatomy

PRACTICAL ANATOMY OF THE RABBIT (6th ed.)—B. A. Bensley—*Blakiston's,* 320 p., $3. A new edition of a laboratory guide long and successfully used in many zoology departments.

Science News Letter, September 24, 1938

Psychology

ADVENTURES IN SELF-DISCOVERY—David Seabury—*Whittlesey House,* 324 p., $2.50. A book for laymen by a popular writer.

Science News Letter, September 24, 1938

Mathematics

A PREFACE TO MATHEMATICS—C. E. Van Horn—*Chapman and Grimes,* 124 p., $2.50. A short volume intended for normal school use in teaching the teaching of mathematics.

Science News Letter, September 24, 1938

Mathematics

NEW TESTS AND DRILL IN FIRST COURSE ALGEBRA—Walter W. Hart—*Heath,* 91 tests, 40 c.

Science News Letter, September 24, 1938

Geology

BIBLIOGRAPHY OF THE GEOLOGY AND MINERAL RESOURCES OF CALIFORNIA FOR THE YEARS 1931 TO 1936, INCLUSIVE—Solon Shedd—*California Division of Mines,* 139 p., $1.25.

Science News Letter, September 24, 1938

•First Glances at New Books

Additional Reviews On Page 207

General Science

SCIENCE FOR THE CITIZEN—Lancelot Hogben; illus. by J. F. Horrabin—*Knopf,* 1100 p., $5. Almost an encyclopedia, replete with generous quotations, with examples for those who want to do homework, this is a "primer for the age of plenty." It covers the conquests of "time reckoning and space measurement, substitutes, power, hunger and disease, behavior." There is some pungent scientific revolution in the epilogue devoted to science and society. Despite its sheer bulk and inclusiveness, it is interesting and readable.

Science News Letter, September 24, 1938

Geography

200,000 FEET: THE EDGE OF THE WORLD—Michael Powell—*Dutton,* 334 p., illus., $3.50. How a feature movie was made on the Isle of Foula, far off the coast of Scotland. Hard work, a little danger, exasperating happenings that seem funny in retrospect, plus a liberal sprinkling of "stills" from the film, add up into an interesting book.

Science News Letter, September 24, 1938

Psychology

YOUR MIND AND HOW TO USE IT—W. J. Ennever—*Doubleday, Doran,* 274 p., $2.95. A cheerful book intended to inspire and aid those who wish to improve themselves and "streamline their minds." The author is the founder of Pelmanism.

Science News Letter, September 24, 1938

Psychology

THE PROBLEM OF VOCATIONAL GUIDANCE—Herman Schneider—*Stokes,* 108 p., $1.60. Here the author explains his philosophy based on thirty years of experience with young men in training for their occupational futures.

Science News Letter, September 24, 1938

Sociology

AMERICAN FOUNDATIONS FOR SOCIAL WELFARE (Rev. ed.)—Russell Sage Foundation Library, comp. — *Russell Sage Foundation,* 66 p., 50 c. An alphabetical list with brief statement of purposes and names of officers.

Science News Letter, September 24, 1938

Anthropology

SNARES, DEADFALLS, AND OTHER TRAPS OF THE NORTHERN ALGONQUIANS AND NORTHERN ATHAPASKANS — John M. Cooper—*Catholic Univ. of Amer.,* 144 p., 6 plates, $2. This monograph will interest not only ethnologists and anthropologists, but also trappers and outdoorsmen generally, and even inventors. Considering the limitations of their materials, the successful ingenuity of primitive peoples is often astonishing.

Science News Letter, September 24, 1938

Biology

THE SOCIAL LIFE OF ANIMALS—W. C. Allee—*Norton,* 293 p., $3. Those who have followed Dr. Allee's discussions in the journal literature and before science meetings will welcome this full statement of his investigations and conclusions. It is to be hoped also that through this book a wider audience will be found among the educated public in general; for what Dr. Allee has to say has implications extending far outside the special field of biology.

Science News Letter, September 24, 1938

Economics

PUBLIC REGULATION OF MILK MARKETING IN CALIFORNIA—J. M. Tinley—*Univ. of California,* 213 p., $1.50, cloth; $1 paper. A short history of milk marketing, always one of the most important and difficult problems connected with agriculture, and its regulation in California.

Science News Letter, September 24, 1938

General Science—Education

SCIENCE FOR CHILDREN—Wilbur L. Beauchamp and Joe Young West—*Scott, Foresman,* 208 p., 25 c. A manual of method which teachers will undoubtedly find interesting and helpful.

Science News Letter, September 24, 1938

Photography

PRICES TO CHARGE FOR PHOTOGRAPHS —H. Rossiter Snyder—*Fomo Pub. Co.,* 28 p., 50 c. A brief survey into the most important fields of free-lance photographic work making suggestions as to price scales and the way in which to estimate the value of your own work as a photographer.

Science News Letter, September 24, 1938

Geology

STRATIGRAPHY AND MOLLUSCA OF THE EOCENE OF WESTERN OREGON—F. E. Turner—*Geological Soc. of America,* 130 p., $1.25.

Science News Letter, September 24, 1938

Physiology

AN INTRODUCTION TO HUMAN PHYSIOLOGY (2d ed.)—Lathan A. Crandall—*Saunders,* 356 p., illus., $2. A glossary, plus additions and emendations to the text, improve what was already a successful work.

Science News Letter, September 24, 1938

Entomology

MARVELS OF THE INSECT WORLD—Jean-Henri Fabre; Trans. by Percy F. Bicknell; illus. by Robert Gibbings—*Appleton-Century,* 239 p., $2.50. Fabre's wine needs no bush. Just the fact that this book is out, with fascinating tales of insects ranging from bluebottles to butterflies, is enough to bring Fabre enthusiasts swarming in.

Science News Letter, September 24, 1938

Zoology

THE CALIFORNIA WOODPECKER AND I —William Emerson Ritter — *Univ. of Calif. Press,* 340 p., $3.50. See page 198.

Science News Letter, September 24, 1938

Physiology—Psychology

THE NEW BABY—Evelyn S. Bell and Elizabeth Faragoh—*Lippincott,* 64 p., illus., $1. This is a picture book with simple text designed to help parents explain to four-year-old Jack or Susie that a new baby is on the way. It is also planned to prevent the older child's becoming jealous or feeling neglected because of the new member of the family. The specially posed photographs are excellent for their purpose and the book is one of the best things that has been done in this line.

Science News Letter, September 24, 1938

Hygiene

VOCATIONAL HYGIENE, Book One—Daniel Caplin and S. G. Ocean—*Globe,* 225 p., $1.60. See page 199.

Science News Letter, September 24, 1938

Zoology

THE REPTILES OF OHIO—Roger Conant —*Univ. Press, Notre Dame,* 200 p., illus., $2. This book might well serve as a model for a treatment of a regional fauna. For each species data are given covering description, range, habitat and habits, exact collection data by counties, state distribution map. There is a good bibliography, and 23 pages of excellent halftone illustrations.

Science News Letter, September 24, 1938

Philosophy—Science

NINE CHAINS TO THE MOON—R. Buckminster Fuller — *Lippincott,* 382 p., tables, $4. One man's opinion of the past, present and future, offered as "an adventure story of thought." Thought-provoking, even if you don't agree, become provoked at the CAPITALIZED words, and feel that facts need checking oftentimes. The author invented the Dymaxion car and house.

Science News Letter, September 24, 1938